Imaging as a Biomarker:
Standards for Change Measurements in Therapy

Breakout Area 4: Open Architecture and Software Tools:
Image and meta-data collection and analysis, data integration and display

Day 1: Summary of "Big Picture Roadmapping
– The What by When?"
Near, Mid and Long-Term Issues

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Breakout Area 4: Open Architecture and Software Tools:

Image and meta-data collection and analysis, data integration and display

Near-Term 1-3 Years

1. *State Innovation or Challenge: Management of Meta-data and ontologies*

   ❑ Impact of Success:
   - Consistent interpretation of data
   - Interoperability

   ❑ Technical Barriers:
   - Cultural and process barriers
   - Sorting out competing standards
   - Tools for managing the process

   ❑ Key Players:
   - CBIO, CAP, caBIG VCDE, RSNA, etc. – multiple specialized ontology efforts

Near-Term 1-3 Years

2. *State Innovation or Challenge: "Plug-in" or Service oriented architecture*

- ❑ Impact of Success:
    - Reduce cost through reuse
    - Acceleration of commercialization
- ❑ Technical Barriers:
    - Plugging into what? The data management system?
    - Proprietary resistance
    - Poor validation
- ❑ Key Players:
    - DICOM, caBIG, ???

Near-Term 1-3 Years

3. *State Innovation or Challenge: Reference Implementations*

- ❑ Impact of Success:
    - • Publicize, promote ideas
    - • Jumpstart vendor development
- ❑ Technical Barriers:
    - • Agreed-upon standard
- ❑ Key Players:
    - • caBIG

Breakout Area 4: Open Architecture and Software Tools:

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Mid-Term 3-5 Years

1. *State Innovation or Challenge: Management of Meta-data and ontologies*
    - ❑ Impact of Success:
        - Consistent interpretation of data
        - Interoperability
    - ❑ Technical Barriers:
        - Cultural and process barriers
        - Sorting out competing standards
        - Tools for managing the process
    - ❑ Key Players:
        - CBIO, CAP, caBIG VCDE, RSNA, etc. – multiple specialized ontology efforts

Mid-Term 3-5 Years

2. *State Innovation or Challenge: System quality management*

- ❑ Impact of Success:
    - • Reduction of cycle time
    - • Improved reusability of data
- ❑ Technical Barriers:
    - • Developing metrics and phantoms
    - • Agreement on how the data is shared
- ❑ Key Players:
    - • Manufacturers and clinics

Mid-Term 3-5 Years

3. *State Innovation or Challenge: Interacting with workflow engines*

- ❑ Impact of Success:
  - Flexible sourcing
  - Improves productivity
  - Reduce cycle time
  - Improved reproducibility
- ❑ Technical Barriers:
  - Agreeing on one of the multitude of models and standards
- ❑ Key Players:
  - Everybody plus non-medical workflow engine developers

Mid-Term 3-5 Years

4. *State Innovation or Challenge: Data collection protocol management*

- ❑ Impact of Success:
  - Reduced error and variability in data capture
- ❑ Technical Barriers:
  - Proprietary nature of vendors
- ❑ Key Players:
  - Physicists
  - Manufacturers
  - Clinicians

Breakout Area 4: Open Architecture and Software Tools:
Image and meta-data collection and analysis,
data integration and display
Long-Term 5+ Years

1. *State Innovation or Challenge: Automation of processing*

   ❑ Impact of Success:
     - Nirvana
     - Wicked Kool

   ❑ Technical Barriers:
     - Making the processing independent of the data collection
     - Validating the automated process
     - Tying the collected data with the calibration data

   ❑ Key Players:
     - Everyone